Use of a Decision Support Tool to Enable Data-Driven Decision Making

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Abstract

The NHLBI is experimenting with the use of a decision support tool, called Decision Lens, to enable collaborative and data-driven decision making within the Institute. The tool enables quick collection and synthesis of qualitative and quantitative information from multiple participants and sources to facilitate trade-off, prioritization, and resource allocation analysis and decisions. Currently, the NHLBI is assessing the utility of this tool for improved engagement, discussion, and decision-making about initiative prioritization and resource allocation with the National Heart, Lung, and Blood Advisory Council and Board of External Experts. Use of the tool supports discussions about criteria for prioritization and the relationship of those criteria to the strategic goals of the Institute. Captured data are analyzed for voting patterns of individuals and groups, evaluation of performance to inform future program decisions, and out-year planning. It is expected that the tool will promote collaboration, transparency, efficiency, and effectiveness.

Test Case: Initiative Prioritization

Decision Goal: To prioritize development of NHLBI-initiated targeted programs (FOAs and RFPs)

This decision
1) Is recurring
2) Is resource limited
3) Has many alternatives to choose from
4) Has multiple participants

Decision Lens can be used for selection and resource allocation.

Process

1) **Developed Criteria**: NHLBI staff collaborated with members of the National Heart, Lung, and Blood Advisory Council and the Board of External Experts (BEE) to develop parent and children criteria and their associated definitions and rating scales
2) **Established Priorities by Pairwise Weighting:** During facilitated sessions, members of Council and BEE weighed each parent criterion against all other parent criteria and all children against their siblings
3) **BEE Rating of Initiatives**: NHLBI program staff presented FY 2015 and 2016 initiatives at the BEE meeting, and BEE members discussed the initiatives and rated them against the criteria
4) **Revision of Initiatives**: NHLBI program staff revised their initiatives based on the BEE discussion and ratings, and then presented their initiatives to the Council
5) **Council Rating of Initiatives**: Council members discussed the initiatives and rated them against the criteria
6) **Sensitivity Analysis and Resource Allocations:** NHLBI Leadership used Decision Lens to conduct sensitivity and trade off analyses and consider different scenarios for resource allocation and initiative prioritization
7) **Revision of Criteria:** NHLBI staff will collaborate with Council and BEE members to tweak the criteria based on the experience of this first test

Criteria

1. Importance of the scientific, medical, public health, or research-related question, issue, or opportunity.
2. Extent to which the question, issue, or opportunity is not currently being addressed and would be advanced by NHLBI stimulation or facilitation
   a. Extent to which the question, issue, or opportunity is not currently being addressed
   b. Need for NHLBI facilitation
3. Effectiveness of the initiative's approach on influencing the identified question, issue, or opportunity
   a. Appropriateness of the initiative's design to significantly address the question, issue or opportunity
   b. Feasibility and probability of success of executing the proposed design of the initiative
   c. Budget and resources are commensurate with the approach and design
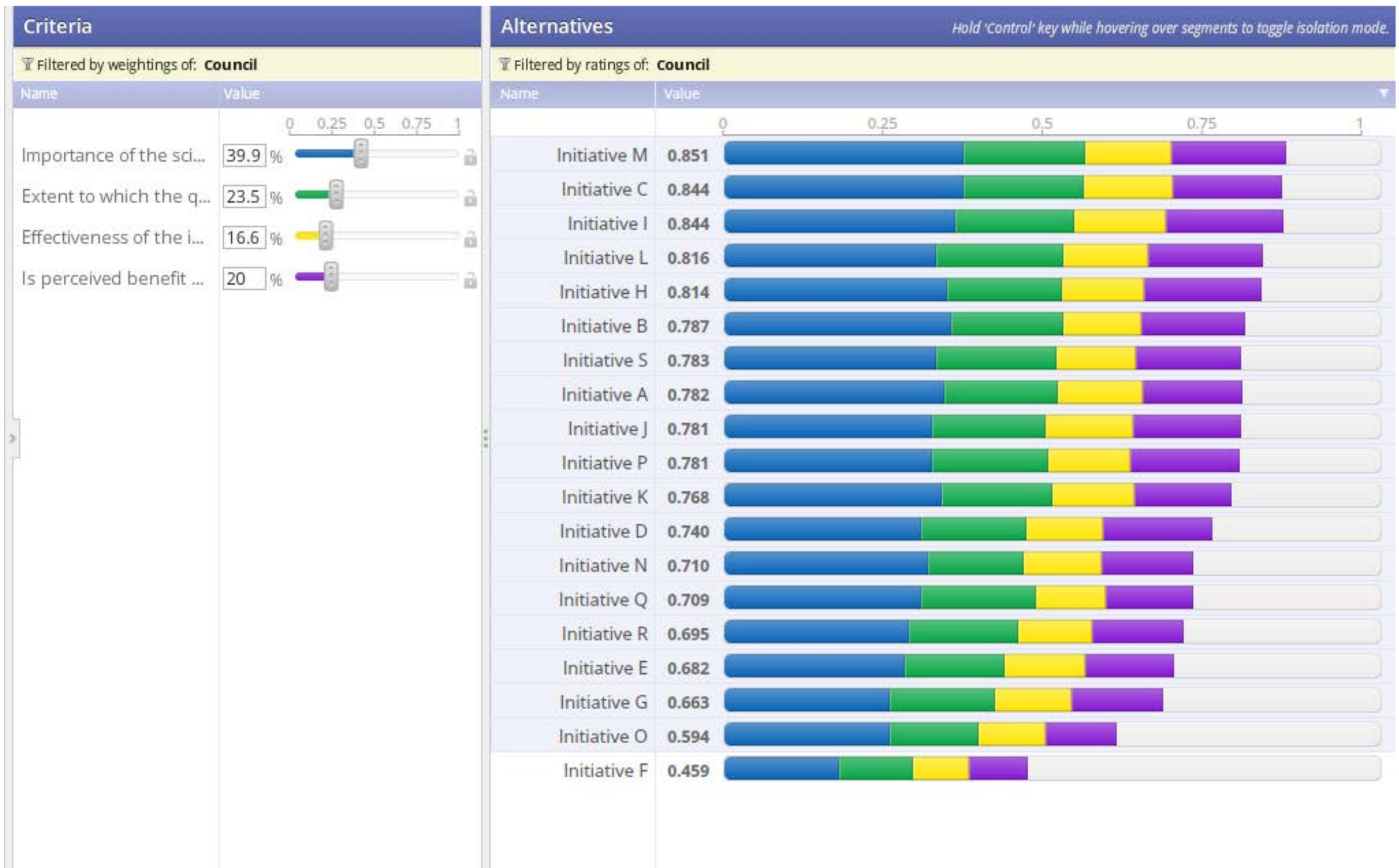4. Is perceived benefit worth the cost?

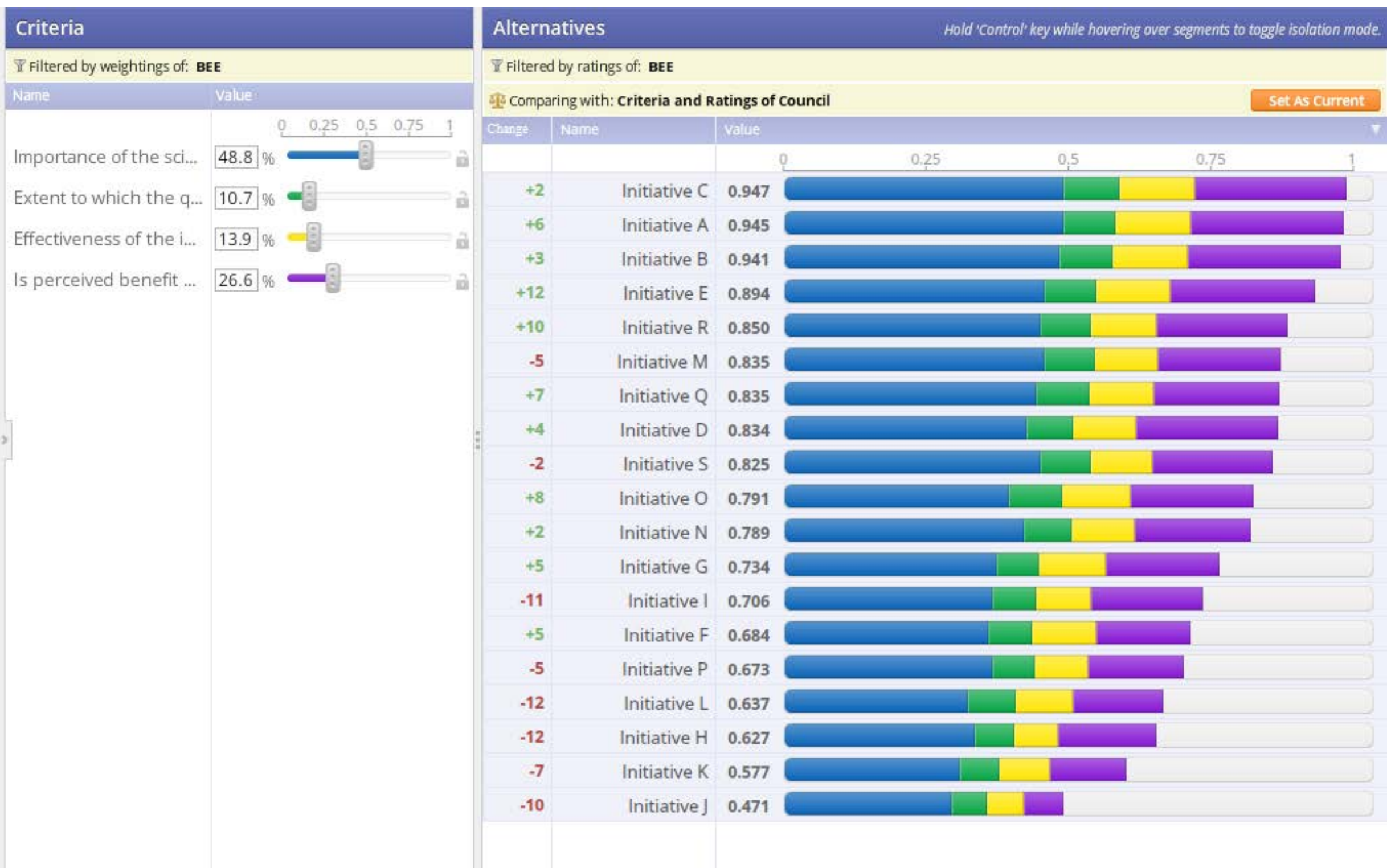Figure 1. Screenshot of Sensitivity Analysis with Council weights, ratings, and rank order

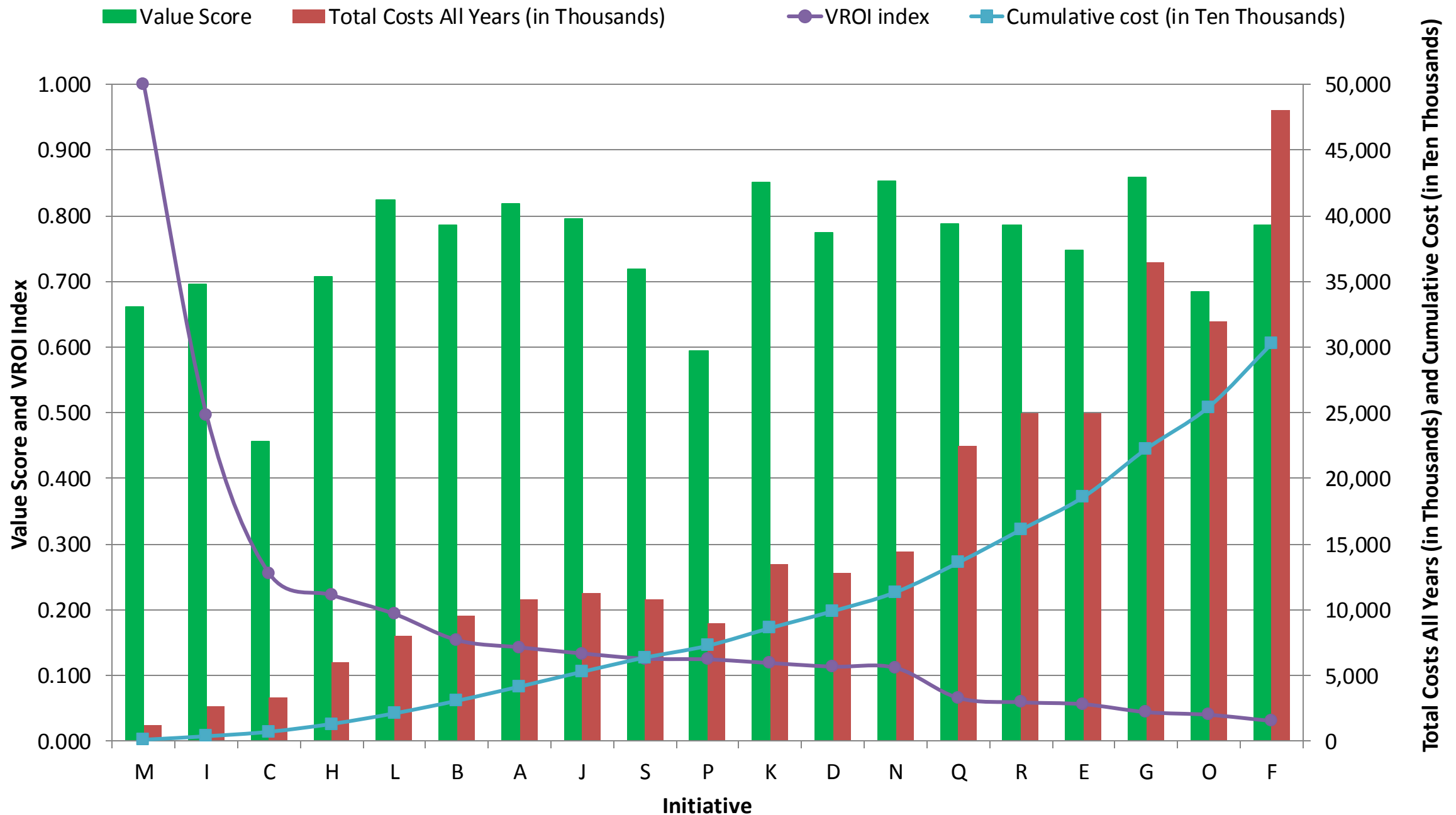Figure 2. Screenshot of Sensitivity Analysis with BEE weights, ratings, and rank order (including comparison to Council)

Figure 3. "Value Return on Investment (VROI)" plot showing VROI index descending using combined weights and Council ratings
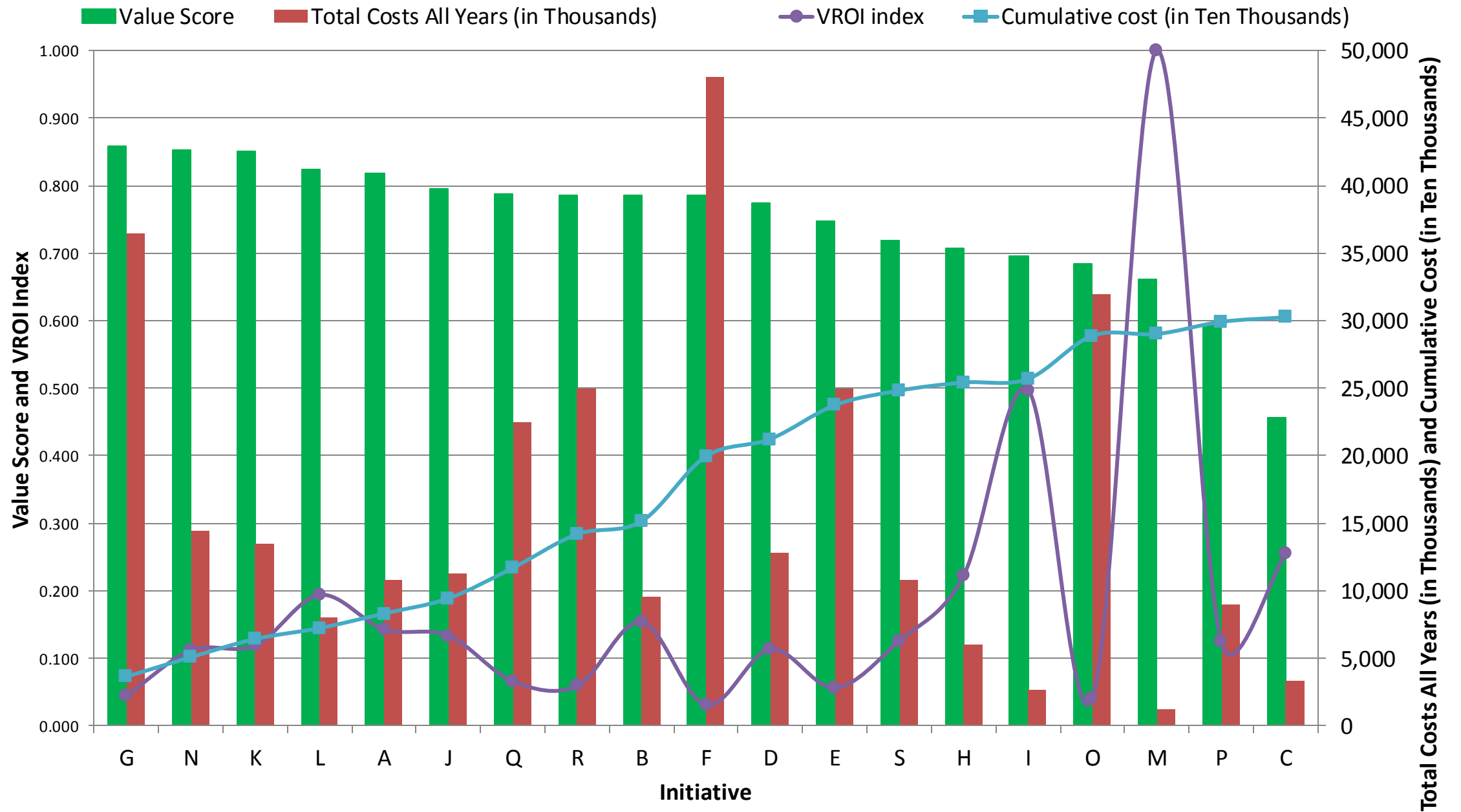
Figure 4. "Value Return on Investment (VROI)" plot showing score descending using combined weights and Council ratings

Figure 5. Screenshot of "Allocating Resources Balancer" with example multi-year funding

Summary

NHLBI's use of Decision Lens for initiative prioritization is still an experiment. We have experienced improved engagement of Council and BEE, and the tool fostered extensive discussion at their respective meetings. It informed leadership decisions about resource allocation and initiative selection.

The tool captures a voting history and associated data, which are and will be analyzed for correlations between the criteria (so that they can be revised) and voting patterns of individuals and groups. Because initiatives are rated against a set of criteria, and not ranked versus each other, relative "value" of initiatives can be compared from year to year.

Some questions remain after one cycle of this process, including:
- Will the tool continue to stimulate discussion?
- Is the tool needed to stimulate discussion?
- Do the participants understand the criteria to be orthogonal?
  - Preliminary results suggest that some participants did not
- Who should participate?
- How resource-limited is this decision?
- Can the discordance between value and cost scales be adequately addressed?

We can further analyze the voting data to begin to answer some of these questions.

The NHLBI is evaluating this tool for other decisions at the Institute.